

406.3.5/MFW/87/01/21/GWP

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Ms. Marian Mlay, Director
Office of Ground-Water Protection
U.S. Environmental Protection Agency
401 M Street, S.W. (WH-550G)
Washington, DC 20460

Dear Ms. Mlay:

SUBJECT: COMMENTS ON GROUND-WATER CLASSIFICATION GUIDELINES

In response to EPA's Notice of Availability published in the Federal Register on December 3, 1986, NRC staff in the Division of Waste Management has reviewed "Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy" (Classification Guidelines) and is pleased to transmit the following comments. In general, we commend EPA's efforts to develop classification guidelines to provide for the protection of ground and surface water resources of the United States. This letter summarizes our general comments and encloses more detailed technical comments.

Based on our review, we are uncertain about how EPA plans to implement the Classification Guidelines. Although EPA states that the guidelines are not enforceable until they are legally incorporated into EPA programs, the document does not describe EPA's plans for implementation of the guidelines. This uncertainty precludes assessment of the implications of the guidelines for NRC regulatory programs. The staff suggests that EPA consider revising the Classification Guidelines to describe how EPA intends to implement the guidelines in current regulatory programs (e.g., RCRA, CERCLA, TSCA, and FIFRA). In addition, the document should describe how EPA intends to integrate the Classification Guidelines with other ground-water protection programs such as the Wellhead Protection Program under the Safe Drinking Water Act.

Second, the Classification Guidelines do not clearly state EPA's intent for application of the guidelines in the two programs where the guidelines have already been implemented. For example, the Classification Guidelines and EPA's regulations for high-level radioactive waste disposal in 40 CFR Part 191 contain similar, but not identical, wording referring to the replaceability and user population criteria for classifying ground water. If EPA intends these criteria to be applied differently for Part 191 than for the guidelines, then EPA should consider discussing the intended differences in the Classification Guidelines. Alternatively, if the criteria are meant to be applied identically, then the Classification Guidelines should clearly state this intent and be revised to provide identical wording.

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Third, EPA's definition of "irreplaceable" sources in the context of "Class I ground water" appears to be somewhat arbitrary because it includes a minimum population threshold of 2500 people. The number of persons using a ground water resource may have little or nothing to do with the replaceability of the resource. The Classification Guidelines correctly identify factors that should be considered in determining whether water resources are replaceable as: (1) available quantity, (2) comparable quality, (3) institutional constraints, and (4) economic feasibility. The guidelines, however, do not provide an adequate rationale for why the number of persons dependent on a water resource directly determines the replaceability of that resource. EPA should consider revising the Classification Guidelines by removing the substantial population threshold from the definition of "irreplaceable" in the definition of Class I ground water.

Fourth, the Classification Guidelines should describe how uses of ground-water resources for purposes other than drinking water supply will be considered in applying the guidelines. Although EPA identifies other beneficial uses of ground water in Appendix B, the guidelines do not describe special considerations or review procedures that would apply to conjunctive uses of ground water. For example, the Classification Guidelines do not describe how beneficial uses such as in-situ leach uranium mining would be considered in applying the guidelines. EPA should consider revising the guidelines to describe how ground-water classification will consider ground-water utilization for purposes other than drinking water supply.

Our last major comment focuses on the limitations of the approaches identified by EPA to assess the vulnerability of confined ground water. The guidelines identify two alternative approaches to assess the vulnerability of ground-water resources to potential contamination: the DRASTIC methodology (quantitative) and professional judgment (qualitative). The DRASTIC methodology primarily emphasizes near-surface, unconfined aquifers. Thus, a confined aquifer would probably not be considered vulnerable based on an analysis using DRASTIC. In addition, the DRASTIC methodology does not consider the vulnerability of ground water to contamination from subsurface sources. In contrast, the professional judgment approach could account for subsurface sources and site-specific characteristics of confined aquifers to estimate ground-water vulnerability. This approach, however, may be applied less consistently than an objective quantitative approach, so ground-water vulnerability determinations may be determined more by subjective opinion than by the characteristics of the hydrogeologic system. EPA should consider revising the Classification Guidelines to identify an approach that promotes consistent application, that considers subsurface sources of contamination, and that can be used to evaluate the vulnerability of confined and unconfined ground-water resources.

MAR 2 - 1987

We appreciate the opportunity to review and comment on the Classification Guidelines. Please contact Michael Weber of my staff at 427-4746 if you have any questions or comments about our review.

Sincerely,

Original Signed by
MICHAEL J. BELL

 Robert E. Browning, Director
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure:
Detailed Comments

DETAILED NRC STAFF COMMENTS ON
"GUIDELINES FOR GROUND-WATER CLASSIFICATION
UNDER THE EPA GROUND-WATER PROTECTION STRATEGY"

1. Implementation of the Guidelines (Page 7)

The Classification Guidelines state that EPA has already implemented the guidelines in two programs: CERCLA site assessments and radioactive waste disposal. The guidelines do not clearly state EPA's intent for implementation of the guidelines in conjunction with EPA's regulations in 40 CFR Part 191 at sites for high-level radioactive waste disposal. Ambiguity in the guidelines is created by the use of similar, but not identical, wording in the definitions of Class I ground water and "special source" of ground water in 40 CFR Part 191. For example, the Classification Guidelines and the regulations in Part 191 both identify irreplaceability as a criterion in determining whether ground water is Class I or a "special source," respectively. The Classification Guidelines provide a user population threshold of 2500 people or a best professional judgement approach to determine whether a ground-water resource is irreplaceable. EPA's regulations in 40 CFR Part 191 identify a user population threshold of "thousands of persons" as of a particular date in determining whether an aquifer is considered a "special source" of ground water. It is unclear how the guidelines definition relates to the definition in 40 CFR 191.

The regulations in Part 191 appear to require that "special sources" of ground water are a subset of Class I ground waters as identified in accordance with the 1984 EPA ground-water protection strategy. EPA should consider revising the Classification Guidelines to explicitly clarify the intended implementation of the guidelines at sites for high-level radioactive waste disposal. EPA should also consider revising the Classification Guidelines to discuss the intended differences in application of the user population thresholds and irreplaceability criteria when identifying "special sources" of ground water within the category of Class I ground waters. This discussion should also identify any potential revisions of the standards in Part 191 that would be necessitated by the new guidelines.

2. Redundancy of Uncommon Pipeline Distance (Pages 34 and 93)

Inclusion of "uncommon pipeline distance" as a criterion in the definition of irreplaceable sources of water in the definition of Class I ground water appears to be redundant with the economic feasibility criterion. EPA's justification for identifying uncommon pipeline distance as a criterion is based on excessive costs associated with uncommonly long pipeline distances for community water supplies. For example, the uncommon pipeline distances listed in Table 4-3 are based on the 1% level of household income threshold. The cost of the pipeline from a water source to a community would be included in the total cost of providing an alternative source of drinking water to a community. Thus, pipeline length would be directly considered under the economic feasibility criterion. EPA should consider eliminating the uncommon pipeline

distance criterion from the criteria used to identify irreplaceable sources of ground water.

3. Quality of Interconnected Surface Waters (Pages 21 and 45)

The Classification Guidelines state that Subclass IIIA includes ground-water units that are highly to intermediately interconnected to adjacent ground-water units of higher class and/or surface waters. The text, however, does not identify surface-water quality as a criterion for consideration in classifying ground-water resources. A ground-water unit of poor quality (i.e., total dissolved solids concentration greater than 10,000 mg/l) should be classified as Class IIIB if the unit is interconnected with surface waters of similarly poor quality and does not recharge any ground water units of higher quality. For example, shallow, poor quality ground water in the Basin and Range Physiographic Province may be interconnected with very poor quality surface waters (e.g., TDS significantly greater than 10,000 mg/l). The guidelines should allow such shallow ground water to be classified as Class IIIB even though the ground-water unit is interconnected with surface waters. EPA should consider revising the Classification Guidelines to include surface-water quality as a criterion to be considered in classifying ground-water resources.

4. Sufficient Yield Criterion (Page 41)

Section 3.5.3 of the Classification Guidelines states that potential sources of drinking water must yield sufficient quantities of ground water to meet the long-term basic needs of an average family. The guidelines establish a criterion of 150 gallon per day as a minimum threshold for sufficient yield. The guidelines, however, do not indicate how this threshold is to be evaluated. Although it may be assumed that the yield would be to a single well or spring, the text does not indicate how an interested party would demonstrate insufficient yield of a ground-water unit. For example, the demonstration could be based on a single specific capacity test at a single well that is completed in only a portion of the ground-water unit. Alternatively, EPA might require an interested party to conduct many single well tests in wells that are fully penetrating and that have been sited in a manner that promotes larger well yields (i.e., siting wells based on fracture trace analysis). EPA should consider revising the Classification Guidelines to describe appropriate demonstrations of insufficient yield.

5. Classifying Institutional Constraints (Pages 35 and 98)

Although the general objective of the classification scheme for institutional constraints is clear, it is unclear why constraints such as "treaties, agreements among states, and decisions by the U.S. Supreme Court" are classified as "Probably Binding" rather than "Binding." In addition, using category titles such as "Possibly Binding", "Probably Binding", and "Unlikely to be Binding," may introduce unnecessary confusion in the classification system. EPA should consider revising the guidelines to provide a

classification scheme based on the difficulty of overcoming institutional constraints imposed by market conditions, regulations, or legal decisions.

6. Evapotranspiration vs. Evaporation (Pages 31 and 107)

The Classification Guidelines provide threshold DRASTIC scores to determine the vulnerability of ground-water resources to potential contamination. Selection of the threshold score depends on the ratio of the estimated annual potential evapotranspiration to the mean annual precipitation. It appears, however, that "potential evapotranspiration" was inadvertently substituted for the term "potential evaporation." Estimates of annual potential evaporation are available for locations around the country. Potential evaporation depends on variables that can be established on a regional basis, such as temperature distributions, ambient humidities, and solar radiation. In contrast, potential evapotranspiration depends on these factors, in addition to the type, density, and health of vegetation available to transpire moisture. Values for these variables are not established on a regional basis. Thus, EPA should revise the guidelines by substituting "annual potential evaporation" for "annual potential evapotranspiration."

7. Consideration of Confined Aquifers (Page 83)

The Classification Guidelines provide an example in Section 4.3.6 of subdividing a Classification Review Area for the purpose of applying the guidelines. Several confined aquifers are identified in the example case as discrete ground-water units. Although the text indicates that actual classification decisions only consider those units that could be affected by the facility, the guidelines do not describe how potential effects of facilities should be evaluated to determine whether ground-water units need to be considered. EPA should revise the guidelines to describe how potentially affected ground-water units should be determined.

8. Description of the High-Level Waste Program (B-13)

The Classification Guidelines describe alternative approaches that EPA considered for determining ground-water vulnerability to contamination. In support of integrative methodologies, Section 3.3.2.5 identifies a time-to-exposure criterion that has been established within the high-level radioactive waste program. A time-to-exposure requirement does not exist in the Department of Energy's high-level radioactive waste program. If the text refers to the ground-water travel time criterion in the Department of Energy's Siting Guidelines (10 CFR Part 960), the text should state that this criterion applies to pre-waste emplacement ground-water travel times that may not equal post-waste emplacement radionuclide travel times or time-to-exposure. The pre-waste emplacement ground-water travel time requirement originated in NRC's regulations for disposal of high-level radioactive waste [cf. 10 CFR Part 60.113]. EPA should consider revising the text to describe the ground-water travel time criterion of the high-level radioactive waste program accurately or to delete it from the discussion.

OFFICIAL CONCURRENCE AND DISTRIBUTION RECORD

LETTER TO: Marian Mlay, Director
Office of Ground-Water Protection
U. S. Environmental Protection Agency

FROM: Robert E. Browning, Director
Division of Waste Management

SUBJECT: COMMENTS ON THE GROUND-WATER CLASSIFICATION GUIDELINES

DATE: MAR 2 - 1987

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